Hilbert schemes, combinatorics and character varieties

E. Carlsson
(University of California at Davis)

I'll explain the remarkable connections between the algebraic combinatorics that appear in the Hilbert scheme of points, and character varieties, as predicted by the conjectures of Hausel, Letellier, and Rodriguez-Villegas. I'll then discuss some recent results and potential future directions in these areas with Rodriguez-Villegas and Mellit. Interestingly, one of the objects that appears is the K-theoretic Ext^1 operatorstudied by Nekrasov, Okounkov and myself, that appears in the AGT conjectures in higher rank.